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10/776,057	02/11/2004	Daniel Ting	112056-0139U	2127

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EXAMINER
MORRISON, JAY A

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/776,057	TING ET AL.
Office Action Summary	Examiner	Art Unit	
	JAY A. MORRISON	2168	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>17 March 2010</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-11,17-34 and 36-41</u> is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-11,17-34 and 36-41</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Remarks

1.   Claims 1-11, 17-34 and 36-41 are pending.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 22-24, 26 and 40 are rejected under 35 U.S.C. 102(b) as being

anticipated by Heckel ("A Technique for Isolating Differences Between Files", by Heckel,

Communications of the ACM, April 1978).

As per claims 22, Heckel teaches

A method for comparing a first data set with a second data set, comprising: (see

introduction)

(a) selecting an entry from the first data set; (pass 1, section 3, page 265; section

4, third paragraph; figure 1)

(b) determining if a hashed value of the selected entry of the first data set is in a hash table, wherein the hash table comprises one or more hashed values of the first data set;(c) adding, in response to determining that the hashed value of the selected entry of first data set is not in the hash table, the hashed value of the selected entry of the first data set to the hash table; (pass 3, section 3, pages 265-266; section 4, third paragraph; figure 1)

(d) removing from the hash table, in response to determining that the hashed value of the selected entry of the first data set is in the hash table, the hashed value of the selected entry of the first data set; (pass 5, page 266, section 4, third paragraph; figure 1; entry marked as match leaves differences unmarked which is equivalent of removal since it is removed from consideration)

(e) selecting an entry from the second data set; (f) determining if a hashed value of the selected entry of the second data set is in the hash table, wherein the hash table further comprises one or more hashed entries of the second data set; (pass 3, section 3, pages 265-266; section 4, third paragraph; figure 1)

(g) adding, in response to determining that the hashed value of the selected entry of the second data set is not in the hash table, the hashed value of the selected entry of the second data set to the hash table; (pass 1, section 3, page 265; section 4, third paragraph; figure 1)

(h) removing from the hash table, in response to determining that the hashed value of the selected entry of the second data set is in the hash table, the hashed value

of the selected entry of the second data set; (pass 3, section 3, pages 265-266; section 4, third paragraph; figure 1)

(i) continuing (a) through (d) and (e) through (h) respectively for all entries in the first and the second data sets until both the first and the second data sets have been completely processed; (pass 3, section 3, pages 265-266; section 4, third paragraph; figure 1)

and (j) reporting a difference between the first data set and the second data set in response to at least one hashed value remaining in the hash table. (section 3, last paragraph)

As per claims 23, <u>Heckel</u> teaches

the adding the hashed value of the selected entry of the first data set to the hash table further comprises adding information with the hashed value of the selected entry of the first data set identifying the hashed value of the selected entry of the first data set as originating from the first data set. (section 3, last paragraph; section 4, third paragraph)

As per claims 24, <u>Heckel</u> teaches

adding the hashed value of the selected entry of the second data set to the hash table further comprises adding information with the hashed value of the selected entry of the second data set identifying the hashed value of the selected entry of the second

data set as originating from the second data set. (section 3, last paragraph; section 4,

third paragraph)

As per claims 26, <u>Heckel</u> teaches

(k) recording all hashed value entries remaining in the hash table as being

unique to either the first data set or the second data set. (section 3, last paragraph;

section 4, third paragraph)

As per claim 40, <u>Heckel</u> teaches

reporting comprises recording the difference on a storage device. (section 5, first

paragraph)

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5.   Claims 1-11, 17-21, 25, 27-34, 36-39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heckel ("A Technique for Isolating Differences Between Files", by Heckel, Communications of the ACM, April 1978) in view of Pohlan (Publication Number 20050015391).

As per claim 1, Heckel teaches

A method for comparing a first comprising unique elements with a second comprising unique elements, comprising: (see introduction)

(a) for each entry in the first, placing a hash value of the entry in a hash table; (pass 1, section 3, page 265; section 4, third paragraph; figure 1)

(b) selecting an entry of the second; (c) looking up a match between a hash value of the selected entry and the hash value of the entry in the hash table; (pass 3, section 3, pages 265-266; section 4, third paragraph; figure 1)

(d) removing, in response to the match between the hash value of the selected entry and the hash value of the entry in the hash table, the hash value of the entry from the hash table; (pass 5, page 266, section 4, third paragraph; figure 1; entry marked as match leaves differences unmarked which is equivalent of removal since it is removed from consideration)

(e) determining if an additional second entry exists; (f) looping to step (b) in response to identifying the additional second entry; (pass 3, section 3, pages 265-266; section 4, third paragraph; figure 1)

and (g) reporting a difference between the first and the second in response to at least one hash value entry remaining in the hash table. (section 3, last paragraph)

Heckel does not explicitly indicate "directory", "wherein the first directory is stored on a source storage system", "wherein the second directory is located on a destination storage system".

However, Pohlan discloses "directory", "wherein the first directory is stored on a source storage system", "wherein the second directory is located on a destination storage system" (paragraph [0012], lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Heckel and Pohlan because using the steps of "directory", "wherein the first directory is stored on a source storage system", "wherein

the second directory is located on a destination storage system" would have given those

skilled in the art the tools to improve the invention by allowing automatic comparison of

the entire hierarchical arrangement of a directory tree. This gives the user the

advantage of not having to manually compare each hierarchical level.

As per claim 2, Heckel teaches

identifying, in response to not locating the match between the hash value of the

selected entry and the hash value of the entry in the hash table, that the hash value of

the selected entry is unique. (section 3, last paragraph; section 4, third paragraph)

Heckel does not explicitly indicate "second directory".

However, Pohlan discloses "second directory" (paragraph [0012], lines 8-12).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Heckel and Pohlan because using the steps of "second

directory" would have given those skilled in the art the tools to improve the invention by

allowing automatic comparison of the entire hierarchical arrangement of a directory tree.

This gives the user the advantage of not having to manually compare each hierarchical

level.

As per claim 3, Heckel teaches

performing, in response to not locating the match between the hash value of the

selected entry and the hash value of the entry in the hash table, a remedial function.

(section 3, last paragraph; section 4, third paragraph)

As per claim 4,

Heckel does not explicitly indicate "the remedial function comprises deleting the selected entry of the second directory".

However, Pohlan discloses "the remedial function comprises deleting the selected entry of the second directory" (paragraph [0012], lines 8-12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Heckel and Pohlan because using the steps of "the remedial function comprises deleting the selected entry of the second directory" would have given those skilled in the art the tools to improve the invention by allowing automatic comparison of the entire hierarchical arrangement of a directory tree. This gives the user the advantage of not having to manually compare each hierarchical level.

As per claim 5, Heckel teaches

identifying in response to no additional entry existing, any remaining hash value entry in the hash table as being unique. (section 3, last paragraph; section 4, third paragraph)

Heckel does not explicitly indicate "first directory".

However, Pohlan discloses "first directory" (paragraph [0012], lines 8-12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Heckel and Pohlan because using the steps of "first directory" would have given those skilled in the art the tools to improve the invention by

allowing automatic comparison of the entire hierarchical arrangement of a directory tree.

This gives the user the advantage of not having to manually compare each hierarchical

level.

As per claim 6, <u>Heckel</u> teaches

performing in response to no additional entry existing, a remedial

function.(section 3, last paragraph)

As per claim 7,

<u>Heckel</u> does not explicitly indicate "the remedial function comprises deleting the

selected entry first directory of the first directory".

However, <u>Pohlan</u> discloses "the remedial function comprises deleting the

selected entry first directory of the first directory" (paragraph [0033], lines 12-16).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine <u>Heckel</u> and <u>Pohlan</u> because using the steps of "the

remedial function comprises deleting the selected entry first directory of the first

directory" would have given those skilled in the art the tools to improve the invention by

allowing automatic comparison of the entire hierarchical arrangement of a directory tree.

This gives the user the advantage of not having to manually compare each hierarchical

level.

As per claim 8,

Heckel does not explicitly indicate "the remedial function comprises transferring the selected entry from the first directory to the second directory".

However, Pohlan discloses "the remedial function comprises transferring the selected entry from the first directory to the second directory" (paragraph [0033], lines 12-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Heckel and Pohlan because using the steps of "the remedial function comprises transferring the selected entry from the first directory to the second directory" would have given those skilled in the art the tools to improve the invention by allowing automatic comparison of the entire hierarchical arrangement of a directory tree. This gives the user the advantage of not having to manually compare each hierarchical level.

As per claim 9,

Heckel does not explicitly indicate "the data are organized by a RAID system".

However, Pohlan discloses "the data are organized by a RAID system" (paragraph [0027], lines 7-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Heckel and Pohlan because using the steps of "the data are organized by a RAID system" would have given those skilled in the art the tools to improve the invention by allowing automatic comparison of the entire hierarchical

arrangement of a directory tree. This gives the user the advantage of not having to

manually compare each hierarchical level.

      As per claim 10, <u>Heckel</u> teaches

      the hash table comprises a B-tree. (section 4, third paragraph)

      As per claim 11, <u>Heckel</u> teaches

      the hash table comprises a fast lookup data structure. (section 4, third

paragraph)

      As per claims 17-18,

      These claims are rejected on grounds corresponding to the arguments given

above for rejected claims 1-2 and are similarly rejected.

      As per claim 19-21,

      These claims are rejected on grounds corresponding to the arguments given

above for rejected claim 1 and are similarly rejected.

      As per claims 25,

      <u>Heckel</u> does not explicitly indicate "the data are organized by a RAID system".

      However, <u>Pohlan</u> discloses "the data are organized by a RAID system"

(paragraph [0027], lines 7-10).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Heckel and Pohlan because using the steps of "the

data are organized by a RAID system" would have given those skilled in the art the tools

to improve the invention by allowing automatic comparison of the entire hierarchical

arrangement of a directory tree. This gives the user the advantage of not having to

manually compare each hierarchical level.

As per claims 27-31,

These claims are rejected on grounds corresponding to the arguments given

above for rejected claims 10-13 and 16 and are similarly rejected.

As per claims 32, Heckel teaches

A system for performing a consistency check of a source replicated to a

destination by comparing entries in the source and destination, comprising: (see

introduction)

one or more storage devices configured to store one or more entries of a group

consisting of the source and the destination; (pass 1, section 3, page 265; section 4,

third paragraph; figure 1)

and a process configured to compare entries in the source with entries in the

destination by storing a hash value of each entry of the source and the destination in a

hash table, the process further configured to remove from the hash table any hash

value which matches any hash value of the source and the destination. (pass 3, section

3, pages 265-266; section 4, third paragraph; figure 1; entry marked as match leaves

differences unmarked which is equivalent of removal since it is removed from

consideration)

Heckel does not explicitly indicate "directory" or "directories".

However, Pohlan discloses "directory" or "directories" (paragraph [0012], lines 1-

5)

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Heckel and Pohlan because using the steps of

"directory" or "directories" would have given those skilled in the art the tools to improve

the invention by allowing automatic comparison of the entire hierarchical arrangement of

a directory tree. This gives the user the advantage of not having to manually compare

each hierarchical level.

As per claims 33,

Heckel does not explicitly indicate "the process executes on a computer

associated with the source directory".

However, Pohlan discloses "the process executes on a computer associated with

the source directory" (paragraph [0030], lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Heckel and Pohlan because using the steps of "the

process executes on a computer associated with the source directory" would have given

those skilled in the art the tools to improve the invention by allowing automatic

comparison of the entire hierarchical arrangement of a directory tree. This gives the

user the advantage of not having to manually compare each hierarchical level.

As per claims 34,

Heckel does not explicitly indicate "the process executes on a computer

associated with the destination directory".

However, Pohlan discloses "the process executes on a computer associated with

the destination directory" (paragraph [0030], lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Heckel and Pohlan because using the steps of "the

process executes on a computer associated with the destination directory" would have

given those skilled in the art the tools to improve the invention by allowing automatic

comparison of the entire hierarchical arrangement of a directory tree. This gives the

user the advantage of not having to manually compare each hierarchical level.

As per claims 36,

This claim is rejected on grounds corresponding to the arguments given above

for rejected claim 32 and is similarly rejected.

As per claim 37,

This claim is rejected on grounds corresponding to the arguments given above

for rejected claims 1 and 32 and is similarly rejected.

As per claim 38,

Heckel does not explicitly indicate "program instructions that alternate in selecting entries from the source and destination directories".

However, Pohlan discloses "program instructions that alternate in selecting entries from the source and destination directories" (paragraph [0030], lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Heckel and Pohlan because using the steps of "program instructions that alternate in selecting entries from the source and destination directories" would have given those skilled in the art the tools to improve the invention by allowing automatic comparison of the entire hierarchical arrangement of a directory tree. This gives the user the advantage of not having to manually compare each hierarchical level.

As per claim 39, Heckel teaches

reporting comprises recording the difference on a storage device. (section 5, first paragraph)

As per claim 41, Heckel teaches

the process is further configured to add to the hash table any hash value which does not match any hash value. (section 4, third paragraph)

Heckel does not explicitly indicate "of the source directory and the destination directory".

However, Pohlan discloses "of the source directory and the destination directory" (paragraph [0030], lines 1-5)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Heckel and Pohlan because using the steps of "of the source directory and the destination directory" would have given those skilled in the art the tools to improve the invention by allowing automatic comparison of the entire hierarchical arrangement of a directory tree. This gives the user the advantage of not having to manually compare each hierarchical level.

Response to Arguments

6.   Applicant's arguments with respect to claims 1-11, 17-34 and 36-41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7.   The prior art made of record, listed on form PTO-892, and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jay A. Morrison whose telephone number is (571) 272-7112. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached on (571) 272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jay A Morrison/
Examiner, Art Unit 2168

Jay Morrison
TC2100